



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

15. Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in New Windsor College, New Windsor, Maryland.

Show that the *eastward deviation* of bodies falling from a great height is

$$E_d = \frac{4\pi t(H - \frac{1}{2}\Delta) \cos \phi}{3T}.$$

Solutions to these problems should be received on or before August 1st.

DIOPHANTINE ANALYSIS.

Conducted by J. M. COLAW, Monterey, Va. All contributions to this department should be sent to him.

SOLUTIONS TO PROBLEMS.

5. Proposed by ISAAC L. BEVERAGE, Monterey, Virginia.

Find three numbers the sum of the squares of any two of which diminished by their product shall be a square number.

Solution by ARTEMAS MARTIN, LL. D., U. S. Coast and Geodetic Survey Office, Washington, D. C.

Let rx , ry , rz represent the numbers. Then we must satisfy

$$x^2 - xy + y^2 = \square \dots (1),$$

$$y^2 - yz + z^2 = \square \dots (2),$$

$$x^2 - xz + z^2 = \square \dots (3),$$

rejecting the square factor r^2 .

Assume $x = 2pq - q^2$, $y = p^2 - q^2$, and (1) is satisfied. If we take $p=3$, $q=1$, we have $x=5$, $y=8$, and by substitution (2) and (3) become

$$z^2 - 5z + 25 = \square \dots (4),$$

$$z^2 - 8z + 64 = \square \dots (5).$$

Now put (5) $= (z - 2n)^2$ and we get $z = \frac{16 - n^2}{2 - n}$.

Substituting this value of z in (4) and reducing, $n^4 - 5n^3 + 3n^2 - 20n + 196 = \square = (n^2 - \frac{1}{2}n + 14)^2$ say, whence $n = \frac{1}{2}$; therefore $z = \frac{15\frac{3}{4}}$, and, taking $r=5$, $rx=25$, $ry=40$, $rz=168$, three numbers satisfying the conditions of the problem,

Also solved by H. W. DRAUGHON, and G. B. M. ZERR.

6. Proposed by Professor G. B. M. ZERR, A. M., Principal of High School, Staunton, Virginia.

Find three whole numbers the sum of any two of which is a cube.

Solution by H. W. DRAUGHON, Clinton, Louisiana.

Let the three numbers be, $\frac{1}{2}(x^3 + y^3 - z^3)$, $\frac{1}{2}(x^3 - y^3 + z^3)$, and $\frac{1}{2}(y^3 - x^3 + z^3)$, then,

$$\frac{1}{2}(x^3 + y^3 - z^3) + \frac{1}{2}(z^3 - y^3 + z^3) = x^3,$$

$$\frac{1}{2}(x^3 + y^3 - z^3) + \frac{1}{2}(y^3 - x^3 + z^3) = y^3, \text{ and}$$

$$\frac{1}{2}(y^3 - x^3 + z^3) + \frac{1}{2}(x^3 - y^3 + z^3) = z^3.$$

In order that the numbers may be positive and integral we must make

$z^3 < x^3 + y^3$ and $z^3 > z^3 - z^3$, and x , y , and z must be even numbers or two odd and the other even.

Ex. Put $x=9$, $y=7$, and $z=8$, the resulting numbers are, 280, 449, and 63.

Also solved by P. S. BERG, M. A. GRUBER, ARTEMAS MARTIN, H. C. WHITAKER, and G. B. M. ZERR.

8. Proposed by Hon. JOSIAH H. DRUMMOND, Portland, Maine.

Every odd square is of the form $4a+1$; find the value of a for the n th consecutive odd square.

Solution by M. A. GRUBER, A. M., War Department, Washington, D. C., and R. H. YOUNG, West Sunbury, Pennsylvania.

The consecutive odd squares are the squares of the consecutive odd numbers.

The difference between two consecutive odd numbers is 2.

Beginning with the odd number 1, the next odd number is 1×2 greater than 1; the 3d odd number is 2×2 greater than 1; the 4th odd number is 3×2 greater than 1, and so on to the n th odd number which is accordingly $n-1$ times 2 greater than 1.

The n th odd number is, therefore, $1+2n-2$, or $2n-1$.

$\therefore (2n-1)^2 = 4a+1$, and $a = n^2 - n = n(n-1)$.

Also solved by A. H. BELL, C. W. M. BLACK, H. W. DRAUGHON, ARTEMAS MARTIN, P. H. PHILBRICK, H. C. WHITAKER, G. B. M. ZERR, and the PROPOSER

AVERAGE AND PROBABILITY.

Conducted by B. F. FINKEL, Kidder, Missouri. All Contributions to this department should be sent to him.

SOLUTIONS TO PROBLEMS.

Proposed by Miss LEOA MILLER, B. L., Professor of Natural Science and Art, Kidder Institute, Kidder, Missouri.

A deer, wounded at the corner of a square park, is equally liable to run in a straight line in any direction, from the corner of the park, and, at the same time, is also equally liable to drop dead before running a distance equal to the diagonal of the park. What is the chance that the deer will drop dead in the park?

II. Solution by W. B. MILWARD, Amity, Missouri, and P. H. PHILBRICK, C. E., Lake Charles, Louisiana.

Let $ABCD$ represent the park diameter a , and describe a circle with center A and radius $= a\sqrt{2} = AC$ the diagonal of the park. Area of park $= a^2$; area of circle $= \pi(a\sqrt{2})^2 = 2\pi a^2$. The area of the circle represents one half of all possible ground upon which the deer will fall. Hence the required probability is $\frac{a^2}{4\pi a^2} = \frac{1}{4\pi}$.

[REMARK:—Professor Philbrick writes, June 21: It [the problem above] is